SONY®

Training Manual

LCD Rear Projection

LJ-2T Chassis LJ-2 Chassis

Models: KL-W7000 KL-W7000A
KL-W9000 KL-W9000A

KL-W7000

Circuit Description and Troubleshooting

Course: TVP-11

Table of Contents

Introduction 1

Course Objectives 1

Features 2

General Specifications 2

Video/Audio Inputs/Outputs 2

Picture Modes 3

Board Descriptions 5

How it Works 7

One Piece LIght Engine 7

Convergence 8

Adjusting Method 8

Adjusting Procedure 8

System Control 9

Protect Circuits 9

Video Block 11

Inputs and Switching 11

Video Processing 11

MID (Multi-Image Driver)/RGB I/F 11

LCD Drive 11

Switching Diagram 13

Video Processing Diagram 14

MID / RGB I/F Diagram 15

LCD Drive Diagram 16

Appendix

Service Bulletin 392R3 i

Introduction

Overview

The course covers the following chassis and models of rear projection LCD data monitors. These two chassis have the same circuitry except the LJ-2 has DVD component inputs and a Color Uniformity circuit. The color uniformity circuit is similar to the shading circuit in a conventional rear projection television.

Chassis	Models	
LJ-2T	KL-W7000	KL-W9000
LJ-2	KL-W7000A	KL-W7000A

All of these models are LCD rear projection data monitors with a 16:9 (widescreen) aspect ratio. They accept many computer RGB input resolutions and scan rates. These signals are input to an internal scan converter that converts them to a native scan mode. The native scan mode is 480P. This means that 480 usable vertical lines are scanned progressively to make a picture. A whole frame is displayed one line at a time as opposed to using two fields of alternate odd and even lines to comprise one frame. Therefore, the vertical scan rate of the LCDs is 60Hz and the horizontal scan rate is 31.5kHz.

Repair Notes:

- The remote supplied with these units cannot be used to enter the service mode. You can enter the service mode by using a regular TV remote control and pressing “Display” “5” “Vol +” “Power” in rapid succession while the unit is in the standby mode.
- If the A board is replaced to repair a unit, the following steps must be taken:
  1. Remove the NVM, IC1103, from the **new** board.
  2. Remove the NVM, IC1103, from the **old** board and install it in the new board

Course Objectives

These models are repaired to board level. This course has the following objectives:

- Explain the theory of a rear LCD projector so that the students understand how it works.
- Explain the uses for the different modes so that the students know when to use each mode.
- Explain the circuitry in blocks so that the students can troubleshoot the units to board level.
- Show students how to do the mechanical convergence alignments so they can perform them on site when repair is necessary.

Features

Overview

The KL-W7000, KL-W9000, KL-W7000A and KL-W9000A are LCD rear projection data monitors with a 16:9 (widescreen) aspect ratio. These data monitors use an internal scan converter to display many different types of video signals including, NTSC and RGB.

General Specifications

Projection System

- 3 LCD panels, 1 lens projection system

LCD

- Three 1.35" TFT LCD panels
- Approx. 1.54 millions dots (512,880 pixels each)
- 1068.5 x 480 dots x 3 panels

Lamp

- XL-100U: HID lamp, 100W

Color Reproduction

- 16.7 million colors

Acceptable Signals

- NTSC video signals
- RGB signal

Horizontal Scan Range

- 31.5kHz - 50.0kHz

Vertical Scan Range

- 50Hz - 85Hz

Maximum Resolution

- 1376 x 768 @ 60Hz (with Digital Multi Image Driver)

Plug and Play

- DDC1 and DDC2B compatible

Video/Audio Inputs/Outputs

Video 1, 2, and 3 IN

- Composite Video (phono jacks): 1 Vp-p, 75 ohms unbalanced, sync negative
- S VIDEO (VIDEO 1,3 IN only):
- Y:1 Vp-p, 75 ohms unbalanced, sync negative
- C: 0.286 Vp-p (burst signal), 75 ohms
- DVD Component input (KL-W7000A and KL-W9000A only)
- AUDIO (phono jacks): Two channels, Impedance: more than 47 kohms

VIDEO OUT

- S VIDEO
- Y: 1 V p-p, 75 ohms unbalanced, sync negative
- C: 0.286 Vp-p (burst signal), 75 ohms
- Composite Video (phono jacks): 1 Vp-p, 75 ohms unbalanced, sync negative
- AUDIO (phono jacks): Two channels, Impedance: less than 5 kohms

RGB 1, 2 IN

- VIDEO (D-sub 15 pin, female): R,G,B; 0.7 Vp-p, positive, 75 ohm terminated Sync on Green: 0.286 Vp-p
- SYNC/HD: Composite sync: TTL, high impedance, sync positive/negative
- Horizontal sync: TTL, high impedance, sync positive/negative
- VD: Vertical sync: TTL, high impedance, sync positive/negative
- Audio (RGB 1 IN) (phono jacks) Two channels, Impedance less than 5 kohms
- AUDIO (RGB 2 IN) (stereo mini jack) Two channels, Impedance; more than 47 ohms

Picture Modes

Although these models have a 16:9 aspect ratio screen, they can display video in five different modes.

Normal Mode

Normal mode is for watching video that is in the normal 4:3 aspect ratio.

Full Mode

This mode is for watching a picture recorded originally in a 16:9 format and then compressed to 4:3 format. This mode enlarges the picture only in the horizontal plane.

Zoom Mode

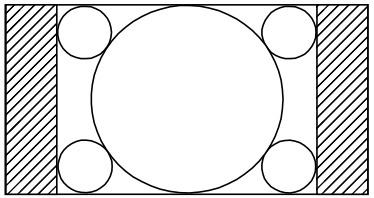
Use this mode when watching “widescreen” video with black bands above and below the picture (letterbox) and sub titles located in the picture. The picture is enlarged horizontally and vertically so that the black bands disappear and only the picture is visible. If a 4:3 picture is input in this mode, the top and bottom will not be seen.

Sub Title Mode

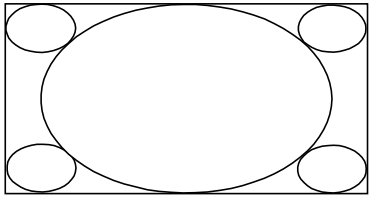
Use this mode when the video is in the 16:9 aspect, but the sub titles are located in the black bands at the bottom of the picture. This mode will enlarge the picture so that the top bands are removed and the bottom is still shown.

Wide Zoom Mode

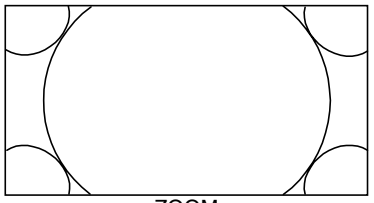
The wide zoom mode enlarges the picture both horizontally and vertically, and then compresses the top and bottom of the picture so that all of the video in a 4:3 picture can be seen. This differs from the Zoom Mode in which the top and bottom of the picture will not be seen. Keep in mind that the top and bottom of the picture will suffer from aspect distortion due to the vertical compression.



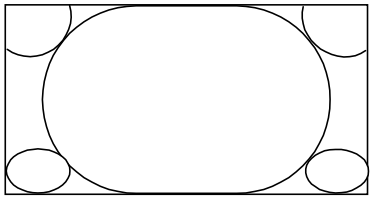
NORMAL



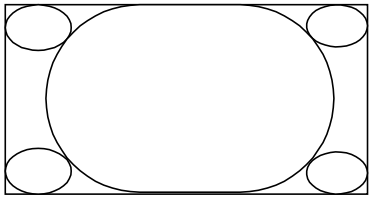
FULL
EXPANDED



ZOOM
EQUALLY EXPANDED



SUBTITLE
BOTTOM COMPRESSED



WIDE ZOOM
TOP/BOTTOM COMPRESSED

NOTES

Board Descriptions

Lamp Power Block: Lamp Power Driver

This circuit board receives power from the (G) Power Supply Board. It receives a turn ON signal from the A Board and will output a protect signal to the A board if it is malfunctioning. It drives the Lamp Block Assembly. A malfunction may cause loss of light or incorrect brightness from the Lamp.

G Board Assembly: Power Supply

This circuit board provides the main power voltages: +20VDC, +10VDC, +5vdc, +17VDC and Standby +5VDC. It receives the AC input from the line cord and Power On/Off control from the A Board. A malfunction here will cause incorrect or no system operation.

GA Board Assembly: PS Power Controller

This circuit board contains the switching regulator controller IC601 for the Power Supply G Board. A malfunction here will cause the power supply not to operate.

A Board Assembly: Video Processing and System Controller

This circuit board processes the input video signals. These signals are processed and sent to the BB Board for MID Processing. After Mid Processing, the signals are returned to the A board to be switched to the C Board. The A Board is responsible for processing L/R Audio for the K Board. It contains the System Controller IC1101 and receives commands and outputs status signals to the HA Board. The A Board also receives Power command from the HB Board (Power SW.), TB Board (Filter Cover SW.) and TA Board (Lamp Cover SW.). It controls the Lamp Power Block, Lamp Driver and ventilation fans (Fan1, Fan2). A malfunction here will cause incorrect or unstable picture, or loss of other functions due to system control failures.

BB Board Assembly: MID (Multi-Image Driver).

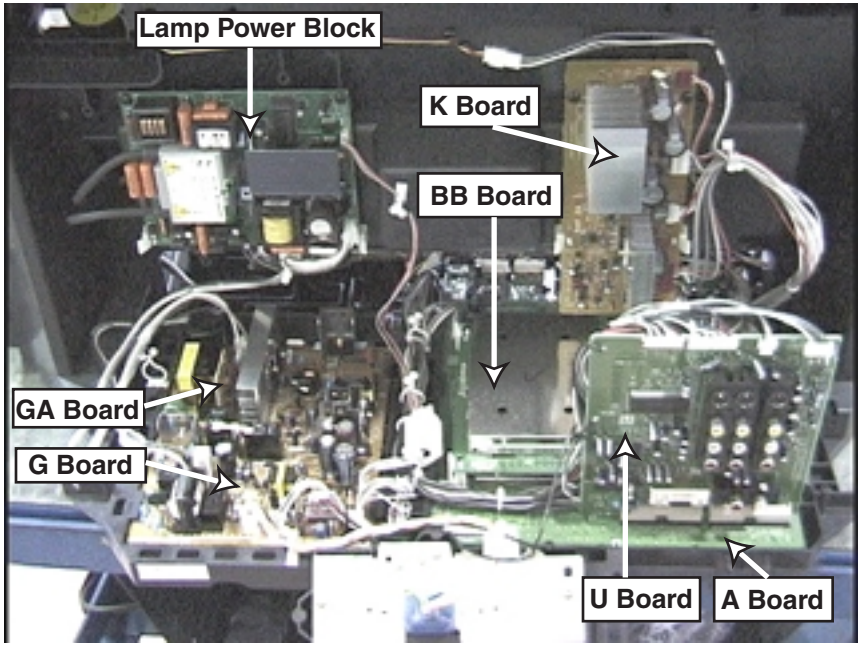
This circuit board contains the A/D Converters for the three Video components (Y, R-Y, and B-Y). It includes the Multi Image Driver and Field Memories used for scan conversion. A malfunction here will cause incorrect colors, loss of picture, or broken up or unstable picture.

U Board Assembly: Video 1 and 3 A/V Inputs, A/V Output and A/V Select

This circuit board contains the Video 1 and 3 S-Video and Composite Video Inputs. Video 1 and 3 left and right audio inputs are also contained here. RGB 1 audio and video connectors are on this board and contain the A/V select switch circuits. The U board receives front panel (Video 2) A/V inputs from the HA Board and output A/V signals to the A Board. It contains the Video Out (S-Video and Composite.) and Audio Out (L/R) connectors. A malfunction here will cause loss of A/V Output.

K Board Assembly: Audio Processor and Output

This circuit board receives audio signals from the A Board and drives the speakers. A malfunction may cause loss of one or both audio channels, audio noise, and/or distorted sound.



TB Board Assembly: Filter Cover Switch

This circuit board contains the interlock switch activated by the ventilation Filter cover. If the filter is not installed or the switch fails, the unit will not operate.

TA Board Assembly: Lamp Cover Switch

This circuit board contains the interlock switch activated by the Lamp cover. If the Lamp cover is removed or the switch fails, the unit will not operate.

HB Board Assembly: Power Switch

This circuit board contains the main Power Switch.

HA Board Assembly: Video 2 A/V Input, User Controls

This circuit board contains the Video 2 S-Video and Composite Video inputs along with the left and right audio inputs. RGB 2 Video and Audio input connectors are also on this board. The HA board includes the User control Key Matrix and Power LED and includes the Headphone connector. This board outputs A/V signals to the U Board and also outputs user control commands to the A Board. It receives the Power Led signal from the A Board. A malfunction here will cause no A/V No. 2 Input or incorrect user controls.

C Board Assembly: Liquid Crystal Display (LCD) Driver

This circuit board contains the LCD driver circuits that drive the (3) R, G and B LCD modules contained in the Optical Unit. It contains the LCD video signal buffer circuits and the LCD Timing Signal Generator IC5004. The C board receives the video and Sync timing signals from the A Board and includes Color Uniformity Circuits controlled by the CU Board in the KL-W7000A and KL-W9000A. A malfunction here will cause incorrect colors or loss of picture.

Optical Unit: LCD Modules, Prism, and Lens Assembly

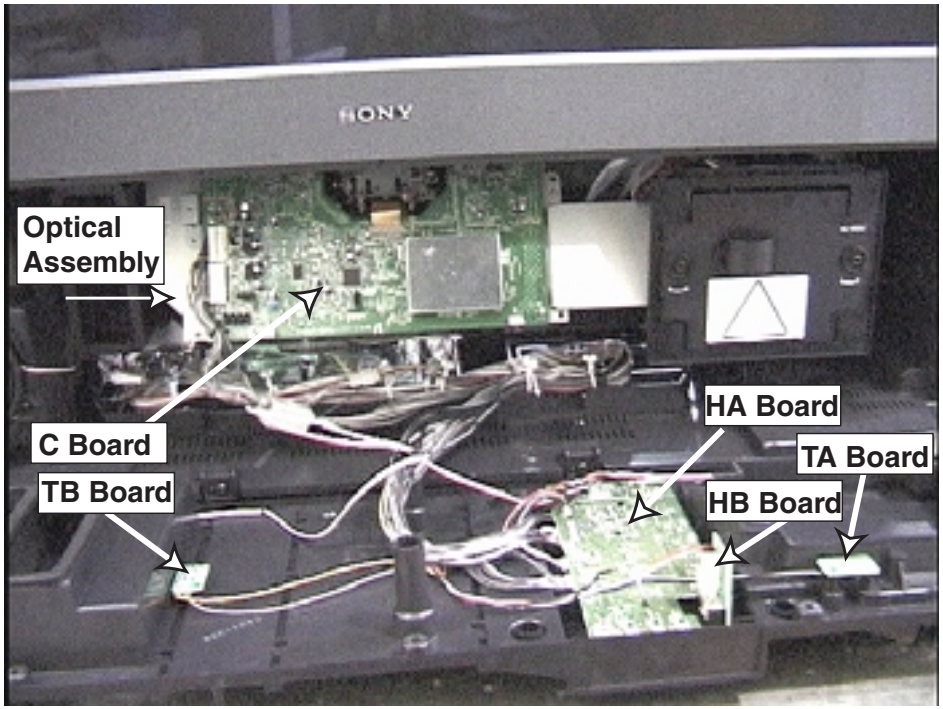
This unit includes the (3) R, G and B LCD imaging modules. It contains the optical prism assembly used to converge the LCD images and includes the optical lens used to form the image on the display screen. The LCD drive signals are received from the C Board. The light is input from the Lamp Block assembly. A malfunction here will cause incorrect colors or loss of picture.

Fan DC: Ventilation (2) Fans (not shown in picture)

These fans are used to ventilate the Lamp Block and Optical Unit. They are driven from the A Board. A malfunction here may cause overheating and potential damage to unit.

CU Board Assembly: KL-W7000A and KL-W9000A Only Color Uniformity Correction Generator (not in picture)

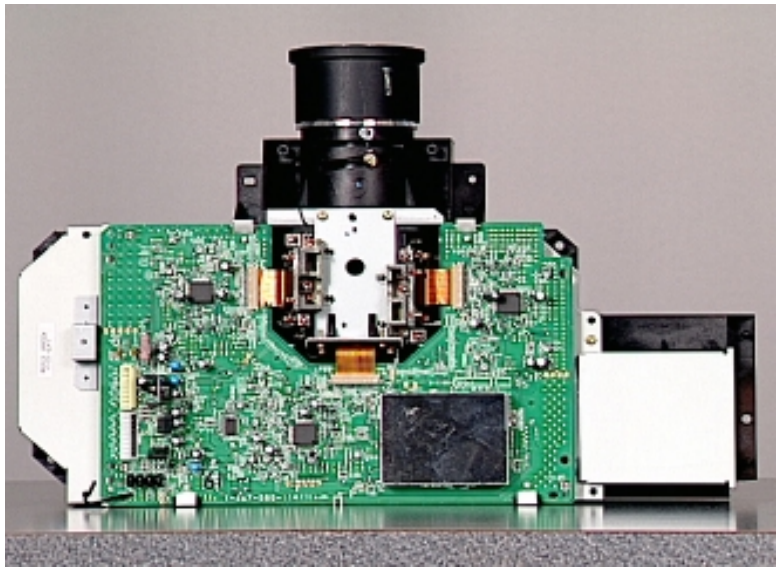
This board generates correction signals for Red Vertical and Red Horizontal color uniformity. It generates correction signals for Green Vertical and Green Horizontal color uniformity. Correction signal levels are adjusted with VR controls on the CU Board and output to the C Board to improve Wide Screen color (and white) uniformity. A malfunction here will cause incorrect color uniformity in the picture.



How it works

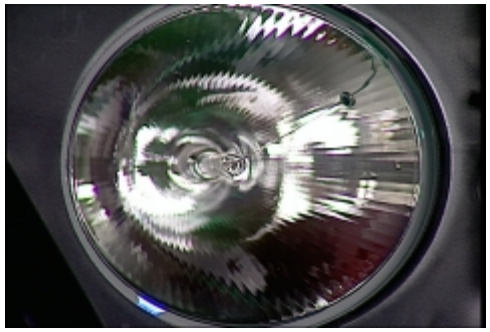
Overview

This section describes how the LCD Rear Projection Data Monitor differs from the standard rear projection television. The main difference between the LCD rear projection system and the standard tube type rear projection television is the use of LCDs instead of picture tubes. Instead of using three tubes this system uses three LCDs. Since there are no picture tubes, there is no High Voltage, deflection, sub deflection or tube biasing circuits. These are replaced with a High Intensity Discharge (HID) Lamp and a timing generator for the three LCDs.

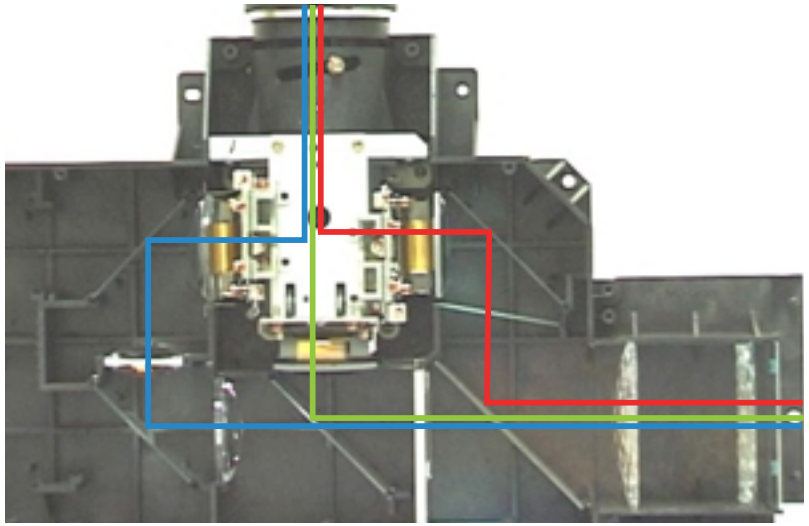


One piece Light Engine

The HID Lamp and LCDs are used in conjunction with a dichroic prism and various lens assemblies to form the one-piece light engine. The engine works when light is emitted from the HID Lamp. The HID Lamp emits light when the Power Lamp Block applies 25kV to it. The HID Lamp works by using the 25kV to create a short arc that creates an even, uniform white light which contains color components across the spectrum of light.



The light is sent through a lens array that separates the light into its various colors. This light is sent through a series of one-way mirrors that pass or reflect only specific colors of light. These colors are red, green and blue. These mirrors work to deliver only red, green and blue light to the LCD for that color.



After the light passes through the three LCDs, it is sent through a dichroic prism. The dichroic prism takes the three colors of light and recombines them. The recombined colors now contain the picture due to the manipulation of the crystals inside each of the LCDs. This picture is sent through a focusing lens. The focusing lens keeps the picture focused on a mirror. The mirror is used to reflect the picture onto the fresnel and lenticular screens. These screens are similar to the screens used in standard rear projection televisions.

Convergence

Overview

Converging a rear projection LCD unit differs greatly from a standard type rear projection TV. This is because there is no magnetic deflection or sub deflection circuits in a LCD rear projector. The alignment then becomes purely mechanical since the geometry of the picture is not adjusted electrically. There are three mechanical adjustments. These adjustments align the LCDs on an angle (skew), horizontally, and vertically.

Adjusting Method

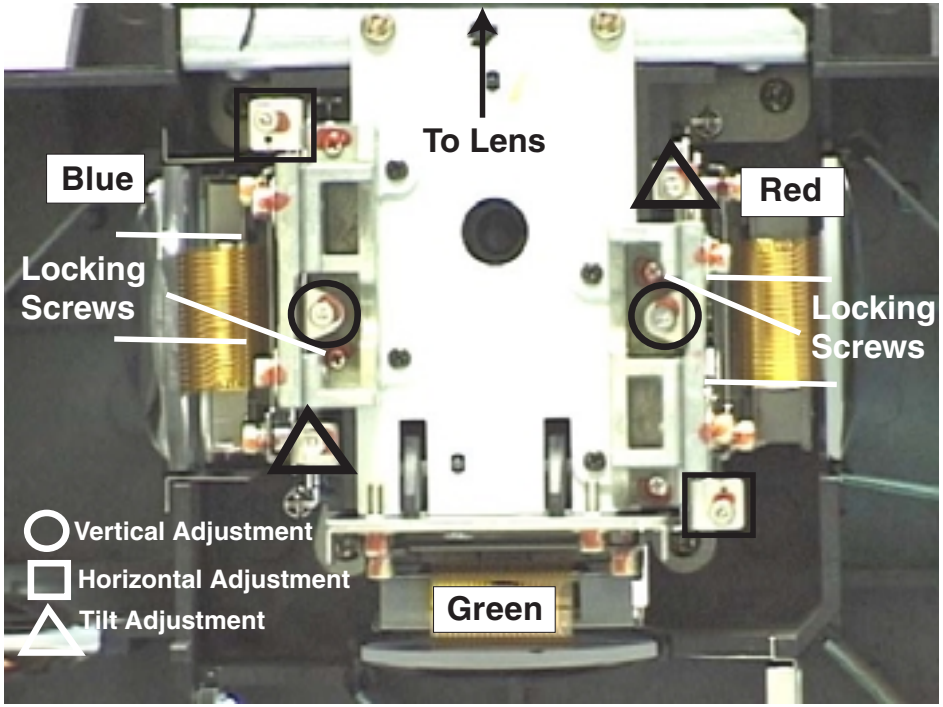
As with other rear projection systems, the green color is located in the middle. In this case the green LCD has no adjustments, therefore it is the reference color. Red and blue are to be adjusted until they converge to green.

Turning three adjustment screws performs these adjustments. These screws are positioned so that when you turn each of them, a plate moves that adjusts the position of the LCD. These plates are spring-loaded so that when the screws are tightened, they push the plate and when they are loosened, the plates are pulled back.

These adjustments are not as easy as they appear. They can be very tedious because it is difficult to get to some of the adjustment screws. Also, when turning the screws, the spring-loaded plates have a tendency to stick. Gently tap the assembly with the end of a screwdriver to make sure the plate has moved as much as it should.

Adjusting Procedure

1) Input a crosshatch pattern into the Video 1 input.
2) Place the unit in Full Mode.
3) Loosen the Locking screw for the color you want to adjust
4) Perform the mechanical alignments for the misadjusted color(s) in the following order. You may have to use a solvent to loosen the loctite on the screws.
   a) Angle (Skew)
   b) Horizontally
   c) Vertically
   d) Repeat above steps if necessary.
   e) Retighten the locking screws
5) Put new loctite on the screws that have been moved and allow it to set before transporting.



System Control

Overview

The system control circuit is responsible for the User Interface and Protection Circuits. The User Interface consists of the key and remote control inputs and the outputs for the LEDs on the front panel. The I^2C bus is an extension of the User Interface and sends and receives data from various ICs to operate the unit. The protection circuits turn the unit OFF when a problem occurs. There are also Self-Diagnostic indicators.

User Interface

The key and remote control inputs receive commands from the user when a button is pushed on the front panel or remote control. These commands will cause IC1101 System Control to send I^2C data to certain ICs or place various control lines to a specific state, typically HIGH or LOW.

Let's use Power On/OFF as an example. When the Standby switch on the HB board is closed, a LOW is placed on CN1009/8. This line is connected to the I MPWRN input of IC1101 System Control. When the IC receives this LOW, it outputs a HIGH from the POW CTL line. This turns the G board power supply ON. The G board supplies power needed by the rest of the set, including the DC voltage used by the Lamp Power Block.

During this time the Power LED is flashing. The Power LED is green. IC1101 System Control checks the protect (interlock) inputs and outputs signals to turn the fans ON. If all is OK then IC1101 System Control outputs the O Lamp CTRL signal. This turns the power supply ON in the Lamp Power Block assembly. When the Lamp Power Block is working correctly, a signal is sent to the I Lamp Prot line of IC1101 System Control. This takes about seven seconds. For a split second, the HID Lamp then comes on dimly and then brightly. The Power Led stops flashing at this point and stays ON. At this time a dim picture should be seen on the screen. It can take up to five minutes for the picture to get to its maximum brightness. **If the set is turned OFF and then turned back ON, the time it takes for this to occur will be longer**.

As long as the Standby switch is closed the set can be turned ON and OFF with the remote control. The sequence to power the set will be the same. The only difference would be that when you turn the Set OFF using the remote control, the Standby LED will be ON. The Standby LED is orange.

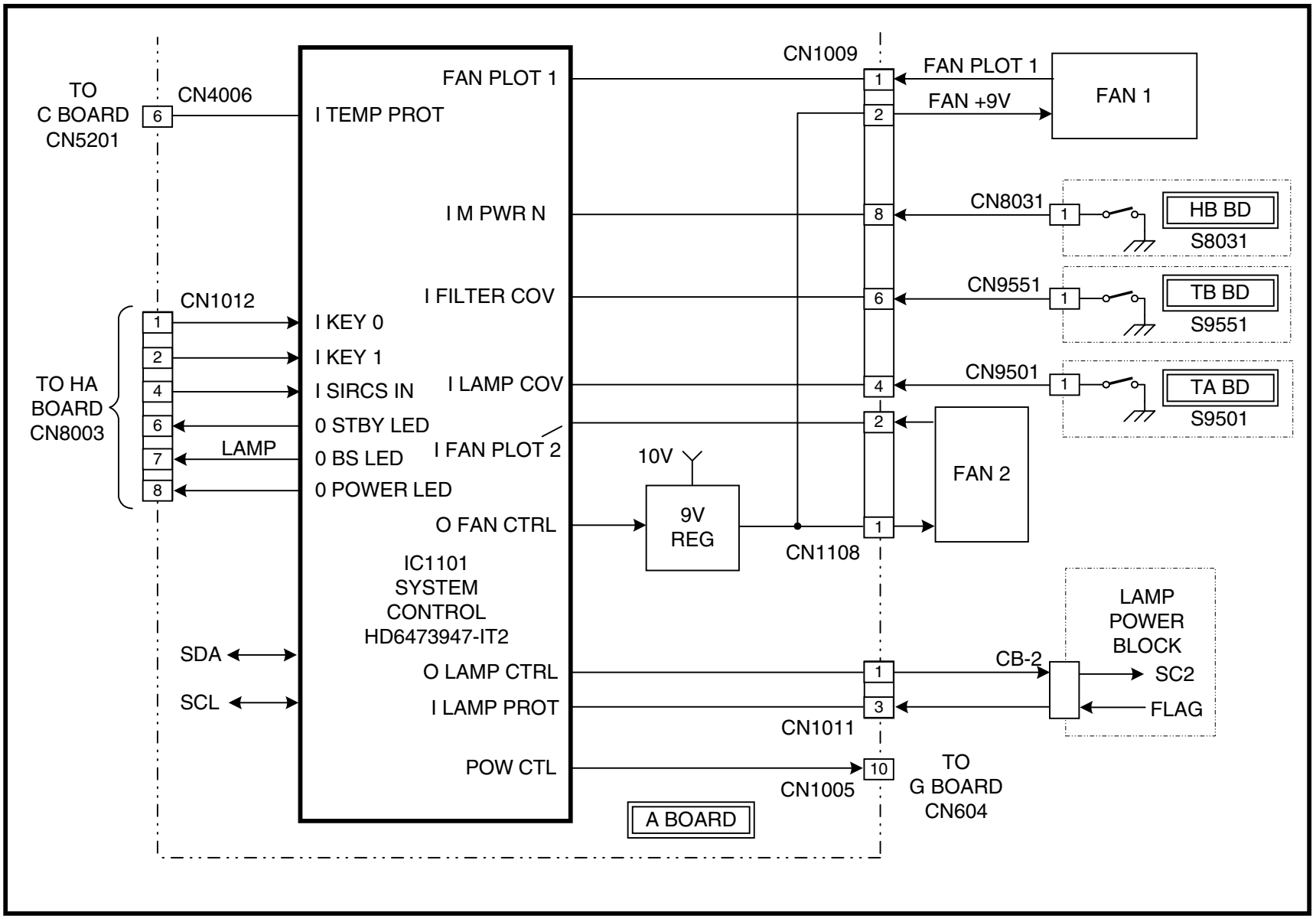
Protect Circuits

This set contains various protect lines that are designed to ensure that the lamp is receiving proper ventilation and voltage. Some of these mentioned in the previous section are for the filter cover, lamp cover and fan protect inputs. The filter and lamp cover each close a switch when they are in the proper position. If they are not in the proper position, the set will shut down. The fans produce a signal and DC voltage dependent upon how fast they are turning. If the fans stop turning, the unit will shut down or not start.

There is an I Temp Prot input on the System Control IC1101. This signal comes from the C board. The circuit it comes from uses a thermistor mounted close to the dichroic prism. If the prism becomes too hot, the value of the resistor rises until it turns a transistor ON. The LOW signal from that transistor is input to I Temp Prot input of IC1101 System Control.

One more protect input to IC1101 is the I Lamp Prot line. If the Lamp Power Block malfunctions or the HID Lamp is burnt out, this line will activate. If the HID Lamp fails it is usually evident because it turns black and there would be pieces of glass inside the HID assembly.

	Power (Green)	Standby (Orange)	Lamp (Red)
Filter Cover	OFF	Flashing	Flashing
Lamp Cover	OFF	Flashing	Flashing
Fan Plot 1	Flashing	Flashing	Flashing
Fan Plot 2	Flashing	Flashing	Flashing
Temp Protect	Flashing	Flashing	Flashing
Lamp Protect	OFF	OFF	Flashing



SYSTEM CONTROL

5TVP11 1288 11/9/00

Video Block

Overview

This section explains the various blocks of the video path. It is supported by drawings on the following pages that show the circuit boards and connector locations of the major signals. Use these drawings as a guide to important signals.

Inputs and Switching

The video-input jacks located on the front and back panels accept NTSC Composite and S Video signals, as well as computer RGB inputs. All signals are eventually routed to the U Board, which contains the A/V Switch, and the Input Select switch which is responsible for switching the VGA RGB and Sync signals. The NTSC signals are sent to the A Board via CN601 and the VGA signals are routed to the A Board via CN602.

IC102 and IC103 are NVMs that are used for DDC1 and DDC2B compatibility. These ICs are used to communicate with the video card about resolutions accepted by the monitor.

Video Processing

The video processing circuit is responsible for taking the NTSC Composite or S Video and converting it to Component Video. It also selects the proper video source. There is a switch to select between NTSC Composite/S Video and the NTSC DVD Input. There is another switch to switch between the processed NTSC and RGB inputs.

If composite video is input, it is A/D converted and input to the 3D Comb Filter. The 3D Comb Filter separates the digitized composite video's Y and C signals. The separate Y and C are output as 9 bits each to the Chroma Decoder. The Chroma Decoder converts the digitized Y and C signals to the Y, R-Y and B-Y components.

If an S Video signal is input then the Y signal is digitized using the same path as composite video, and the C signal is applied directly to the Chroma Decoder. The signals input to the Chroma Decoder are converted to Y, R-Y and B-Y.

These components are D/A converted and output to the Video Select Switch. The Video Select Switch switches between these component signals or the component signals input at J102 DVD In. The selected component signals are input to the BB Video Select switch. This switch selects either the component signals input or the RGB signals input from CN1001. These RGB signals come from the RGB 1 or RGB 2 VGA inputs.

MID (Multi-Image Driver)/RGB I/F

The Multi-Image Driver circuit functions as a scan converter. It converts any signals it receives to 480P format. This means that the horizontal frequency at the MID 2HS output is 31.5kHz and the vertical frequency at the MID 2VS is 60Hz. This circuit is similar to the MID circuit in the KP-53XBR200.

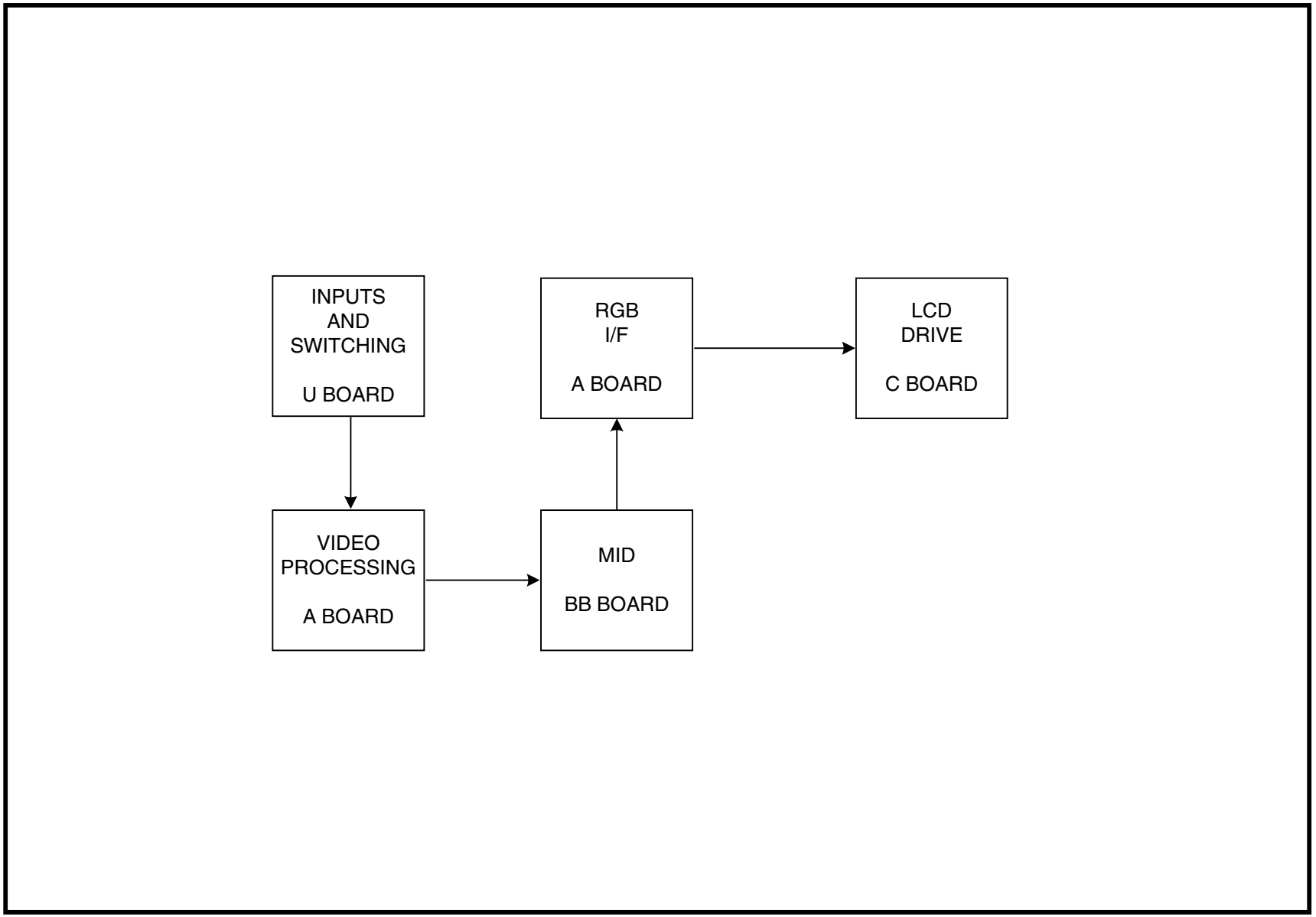
The YUV or RGB signals from the A board are input to the BB board at CN3002/10, 8 and 6. These signals enter the MID circuit where they are digitized and scan-converted to the 480P format. The signals are output to CN3003/11, 9 and 7. This circuit also outputs sync and an YS signal for OSD signals.

The RGB I/F uses a RGB Decoder, which contains a matrix, to convert the YUV signals to RGB if applicable. The OSD signal is mixed with the video at this point. The signal is then output to the RGB I/F. This circuit is used to set the cutoff and drive levels for the R, G and B signals. These are adjustments in the Service Mode.

LCD Drive

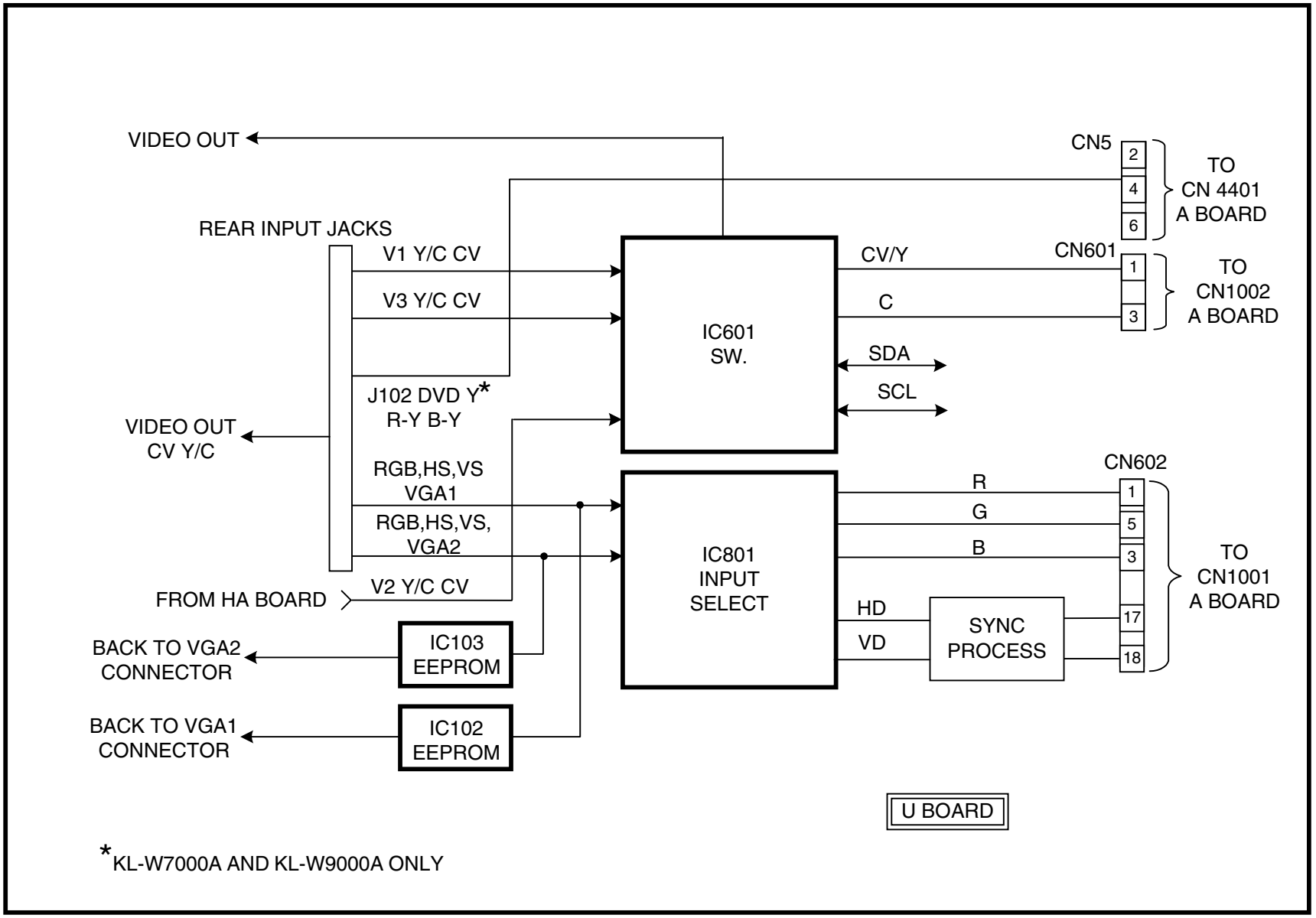
The LCD drive circuit contains three identical LCD driver circuits and a LCD Control circuit. The LCD Control circuit controls the timing for each of the LCD Drivers.

The LCD Drivers produce three signals for each color. These signals, along with the timing signals from the LCD Control, create an image by manipulating the crystals inside the LCD. The light from the HID Lamp, which has been separated to the three colors, is passed through the LCD. The light that passes through the three LCDs is then combined in the dichroic prism. The light is the reflected off of the mirror in the upper cabinet to be seen through the fresnel and lenticular screens on the front of the set.



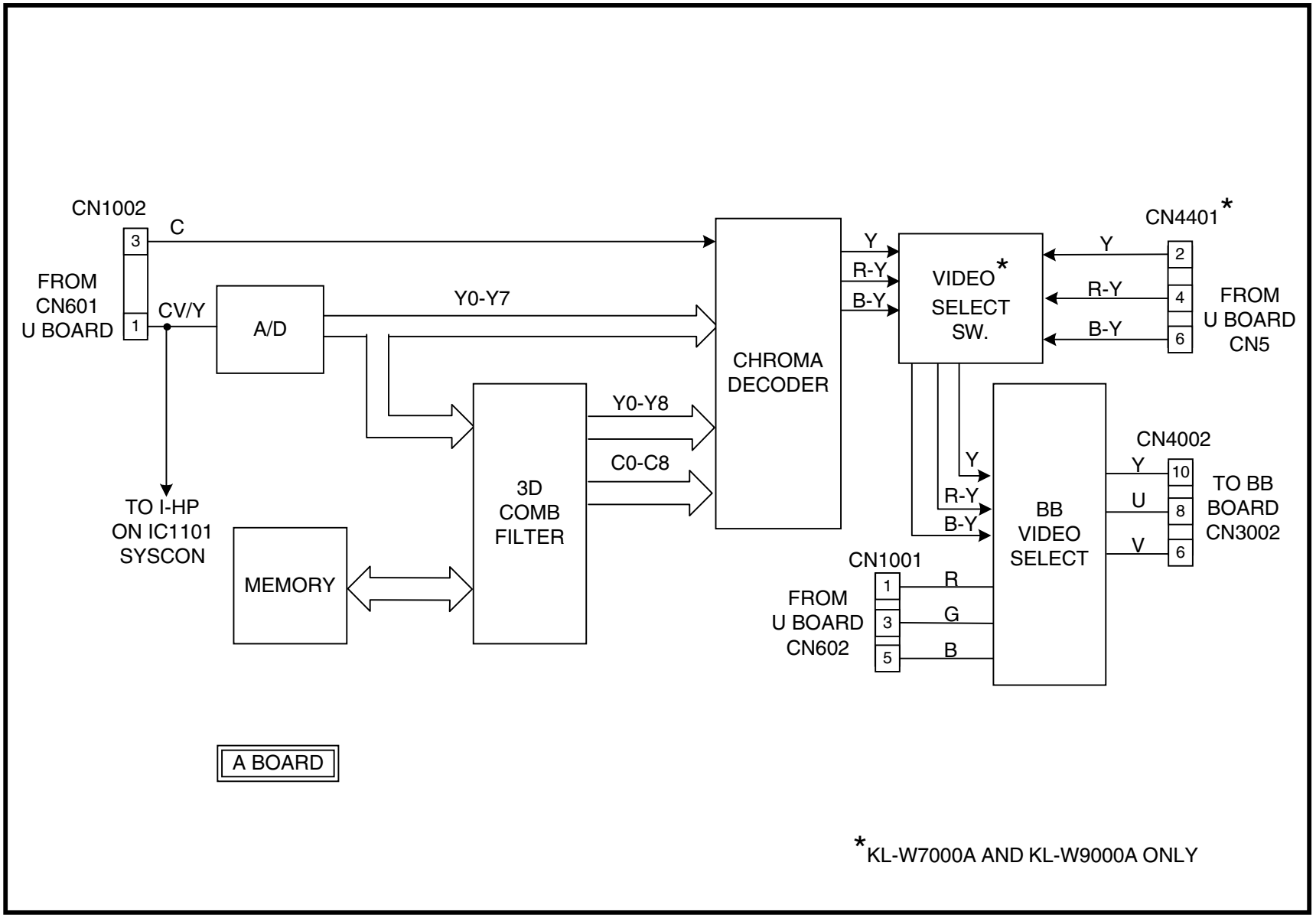
VIDEO BLOCK

6TVP11 1289 11/3/00



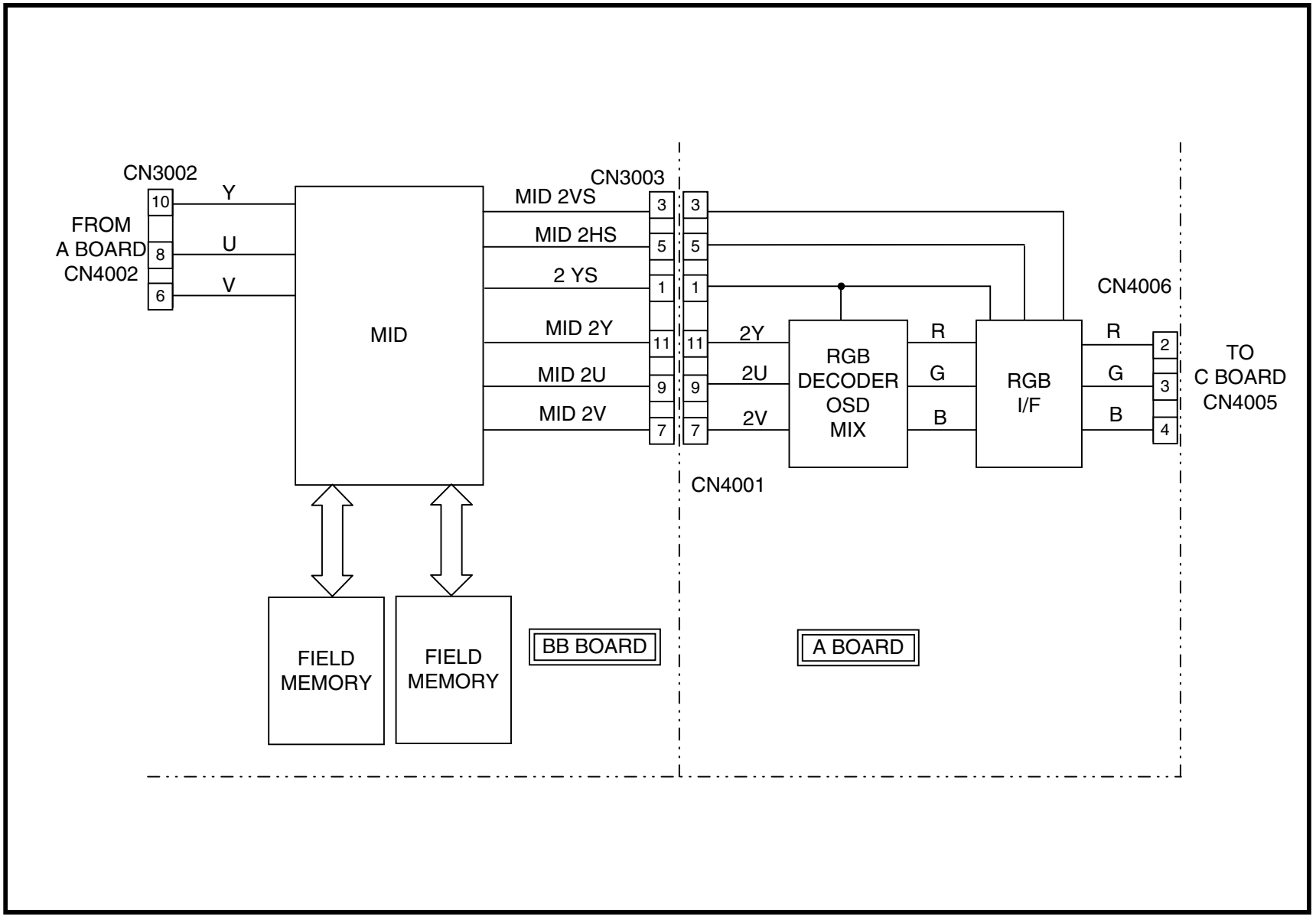
SWITCHING

1TVP11 1284 11/8/00



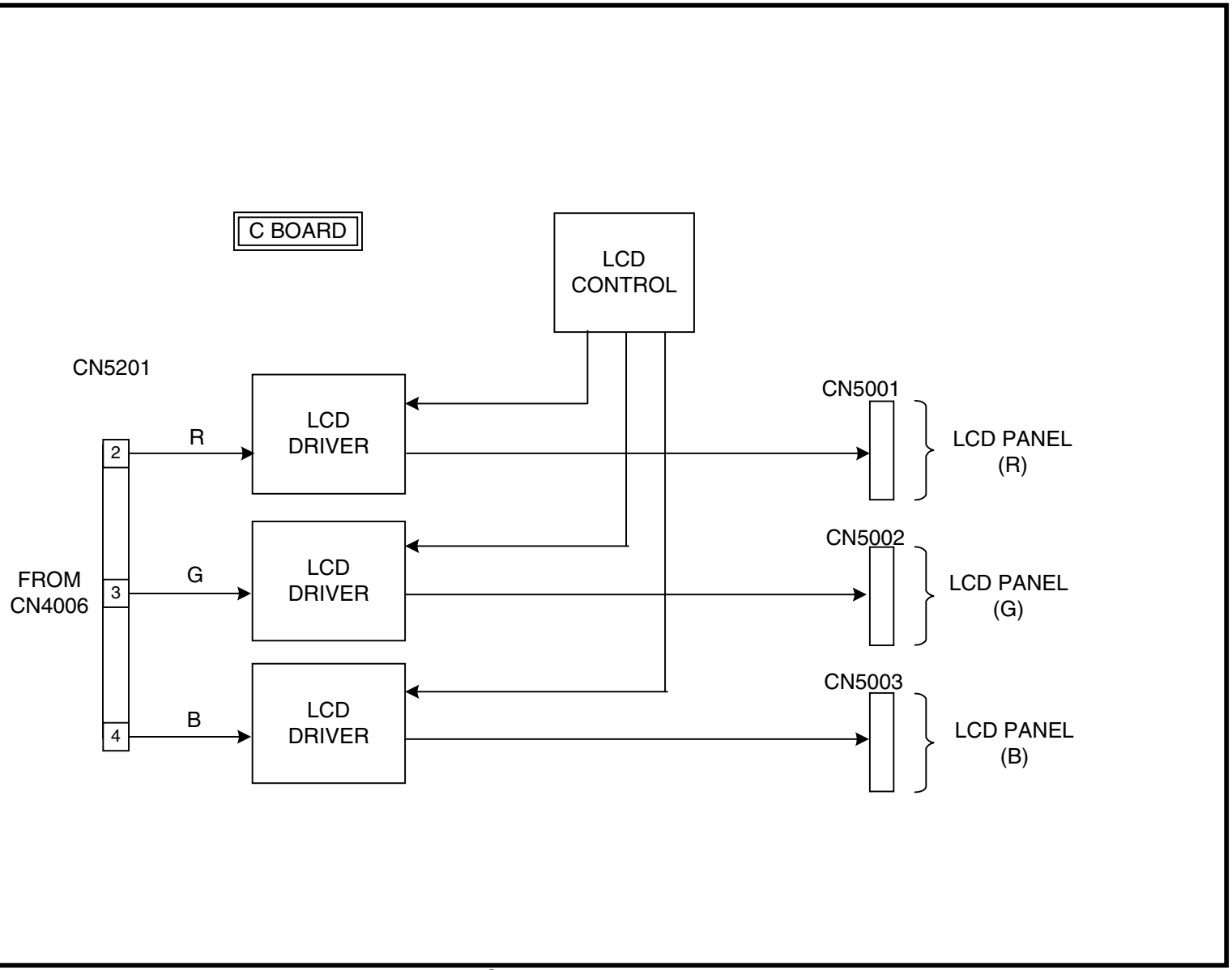
VIDEO PROCESSING

2TVP11 1285 11/8/00



MID / RGB I/F

3TVP11 1286 10/18/00



LCD DRIVE

4TVP11 1287 10/17/00

APPENDIX

SONY®

Sony Service Company
National Technical Services
A Division of Sony Electronics Inc.
Park Ridge, New Jersey 07656

CONFIDENTIAL

Service Bulletin
TV Products

CSV-1

Model: **KL-W7000, KL-W7000A, KL-W9000, KL-W9000A**

No. **392R3**

Subject: **Service Assembly Replacements**

Date: December 29, 1999

Symptom:

(117X) The unit develops a malfunction that requires parts replacements. A service assembly may need to be replaced in order to affect prompt repair of the unit. Part Numbers for ordering the Service Manuals are listed below.

DESCRIPTION	PART NUMBER
KL-W7000/W9000 SERVICE MANUAL	9-965-180-01
KL-W7000A/W9000A SERVICE MANUAL	9-965-237-01
C BOARD EXTENSION CABLE	J-6082-031-A

Solution: If the customer complains of a symptom requiring replacement of a service assembly. Use the appropriate table below to order the correct replacement service assembly. Functional Descriptions are provided to help locate the failed Service Assembly.

KL-W7000 & KL-W7000A SERVICE ASSEMBLY PART NUMBERS

REF	DESCRIPTION	KL-W7000 PART NUMBER	KL-W7000A PART NUMBER
1	K BOARD ASSY	A-1380-551-A	A-1380-551-A
3	LAMP POWER BLOCK	1-473-545-13	1-473-545-13
5	G BOARD ASSY	A-1311-597-A	A-1311-597-A
6	GA BOARD ASSY	A-1311-631-A	A-1311-631-A
7	A BOARD ASSY	A-1298-254-A	A-1298-732-A
9	BB BOARD ASSY	A-1135-929-A	A-1135-929-A2
10	U BOARD ASSY	A-1373-632-A	A-1373-713-A
59	FILTER ASSY	4-051-312-01	X-4034-041-1
64	TB BOARD ASSY	A-1390-763-A	A-1390-908-A
65	TA BOARD ASSY	A-1390-762-A	A-1390-907-A
66	HB BOARD ASSY	A-1372-396-A	A-1372-569-A
67	HA BOARD ASSY	A-1372-395-A	A-1372-564-A

KL-W7000 & KL-W7000A SERVICE ASSEMBLY PART NUMBERS CONT.

REF	DESCRIPTION	KL-W7000 PART NUMBER	KL-W7000A PART NUMBER
68	LAMP BLOCK ASSY	A-1482-758-A	A-1501-247-A
113	C BOARD ASSY	A-1335-094-A	A-1335-110-A
119	OPTICAL UNIT	1-475-523-21	1-475-523-21
126	FAN, DC	1-698-696-11	1-698-696-11
127	CU BOARD ASSY	NA	A-1331-875-A
	REMOTE COMMANDER	1-475-384-11	1-475-384-11

KL-W9000 & KL-W9000A SERVICE ASSEMBLY PART NUMBERS

REF	DESCRIPTION	KL-W9000 PART NUMBER	KL-W9000A PART NUMBER
151	K BOARD ASSY	A-1380-551-A	A-1380-551-A
153	LAMP POWER BLOCK	1-473-545-13	1-473-545-13
155	G BOARD ASSY	A-1311-597-A	A-1311-597-A
156	GA BOARD ASSY	A-1311-631-A	A-1311-631-A
157	A BOARD ASSY	A-1298-254-A	A-1298-732-A
159	BB BOARD ASSY	A-1135-929-A	A-1135-929-A2
160	U BOARD ASSY	A-1373-632-A	A-1373-713-A
209	FILTER ASSY	4-051-312-01	X-4034-041-1
214	TB BOARD ASSY	A-1390-763-A	A-1390-908-A
215	TA BOARD ASSY	A-1390-762-A	A-1390-907-A
216	HB BOARD ASSY	A-1372-396-A	A-1372-565-A
217	HA BOARD ASSY	A-1372-395-A	A-1372-564-A
218	LAMP BLOCK ASSY	A-1501-247-A	A-1501-247-A
269	C BOARD ASSY	A-1335-094-A	A-1335-110-A
275	OPTICAL UNIT	1-475-523-11	1-475-523-11
276	FAN, DC	1-698-696-11	1-698-696-21
	CU BOARD ASSY	NA	A-1331-875-A
	REMOTE COMMANDER	1-475-384-11	1-475-384-11

FUNCTIONAL DESCRIPTIONS AND TROUBLESHOOTING GUIDE

Note: Refer to the Service Manual schematic diagrams for circuit details.

(Ref. 1) K Board Assembly: Audio Processor.
This circuit board receives audio signals from the A Board and drivers the speakers. A malfunction may cause loss of one ore more audio channels , audio noise, or distorted sound output. A malfunction here will cause distorted sound or loss of audio.

(Ref. 3) Lamp Power Block: Lamp Power Driver.
This circuit board receives power from the (G) Power Supply Board. It receives control signals from the A Board. It drives the Lamp Block Assembly. A malfunction may cause loss of light or incorrect brightness from the Lamp. A malfunction here will cause incorrect brightness or loss of picture.

(Ref. 5) G Board Assembly: Power Supply
This circuit board provides the main power voltages: +20VDC, +10VDC, +5vdc, +17VDC, and Standby +5VDC. It receives the AC Input, On/Off control from the A Board. The GA Board contains the switching regulator controller IC601 for this board. A malfunction here will cause incorrect or no system operation.

(Ref. 6) GA Board Assembly: PS Power Controller
This circuit board contains the switching regulator controller IC601 for the Power Supply, G Board. A malfunction here will cause incorrect or no system operation.

(Ref. 7) A Board Assembly: Video Processor and System Controller
This circuit board processes the input video signals for the LCD Drivers, C Board. It includes the Chroma Decoder for the C Video input. It includes the A/D converters and Frame memories for the Comb Filter.. It uses the A/D converters and Frame memories on the BB Board for the video time base conversion.. It contains the System Controller IC1101. It receives Video and Audio signals from the U Board. Processes L/R Audio for the K Board. Receives commands and outputs status signals to the HA Board. It receives Power command from the HB Board (Power SW.), TB Board (Filter Cover SW.), TA Board (Lamp Cover SW.). It controls the Lamp Power Block, Lamp Driver and ventilation fans (Fan1, Fan2). A malfunction here will cause incorrect or unstable picture or loss of other functions due to system controller faults.

(Ref. 9) BB Board Assembly: 3 Channel A/D, MID, and Field Memories.
This circuit board contains the A/D Converters for the 3 Video Channels (Y, R-Y, B-Y). It includes the Memory Interface Decoder and Field Memories for the video time base conversion. A malfunction here will cause incorrect colors, loss of picture, broken up or unstable picture.

(Ref. 10) U Board Assembly: A/V No. 1 & 3 Input, A/V Output Terminal. A/V Select.
This circuit board contains the Video (No. 1 & 3 S-Video & Comp., HD-15 RGB) and Audio (No. 1 & 3 L/R) input connectors. It contains the A/V select switch circuits. It receives front panel (No. 2) A/V inputs from the HA Board. It outputs A/V signals to the A Board. It contains the Video (S-Video & Comp.) and Audio (L/R) output connectors. It outputs A/V signals to the A Board. A malfunction here will cause loss of A/V No. 1 or 3 Input, or A/V Output.

(Ref. 64) TB Board Assembly: Filter Cover Switch.
This circuit board contains the interlock switch activated by the ventilation Filter cover.

(Ref. 65) TA Board Assembly: Lamp Cover Switch.
This circuit board contains the interlock switch activated by the Lamp cover.

(Ref. 66) HB Board Assembly: Power Switch.
This circuit board contains the main Power Switch.

(Ref. 67) HA Board Assembly: A/V No. 2 Input, User Controls.
This circuit board contains the Video (No. 2 S-Video & Comp., HD-15 RGB) and Audio (No. 2 L/R) input connectors. It includes the User control Key Matrix and Power LED. It includes the Headphone connector. It outputs A/V signals to the U Board. It outputs user control commands to the A Board. It receives the Power Led signal from the A Board. A malfunction here will cause no A/V No. 2 Input or incorrect user controls.

(Ref. 68) Lamp Block Assembly: Lamp.
This assembly contains the Lamp that illuminates the 3 x LCD Optical Unit providing the displayed image. A malfunction here will cause incorrect brightness or loss of picture.

(Ref. 113) C Board Assembly: Liquid Crystal Display (LCD) Driver.
This circuit board contains the LCD driver circuits that drive the (3) R,G,B LCD modules contained in the Optical Unit. It contains the LCD video signal buffer circuits and the LCD Timing Signal Generator IC5004. It receives the video and Sync timing signals from the A Board. C Board includes Color Uniformity Circuits controlled by the CU Board in the KL-W7000A and KL-W9000A. A malfunction here will cause incorrect colors or loss of picture.

(Ref. 119) Optical Unit: LCD Modules, Prism, and Lens Assembly.
This unit includes the (3) R, G, B LCD imaging modules. It contains the optical prism assembly used to converge the LCD images. It includes the optical lens used to form the image on the display screen. The LCD drive signal are received from the C Board. The light is input from the Lamp Block assembly. A malfunction here will cause incorrect colors or loss of picture.

(Ref. 126) Fan DC: Ventilation (2) Fans.
These fans are used to ventilate the Lamp Block and Optical Unit. They are driven from the A Board. A malfunction here may cause overheating and potential damage to unit.

(Ref. 127) CU Board Assembly: KL-W7000A and KL-W9000A Only Color Uniformity Correction Generator
Generates correction signals for Red Vert. and Red Horiz. color uniformity. Generates correction signals for Green Vert and Green Horiz color uniformity. Correction signal levels are adjusted with VR controls on the CU Board and output to the C Board to improve Wide Screen color (and white) uniformity. A malfunction here will cause incorrect color uniformity in the picture.

Remote Commander: IR Remote Control.
This unit provides remote control commands via infrared (IR) beam.

The Functional Descriptions And Troubleshooting Guide is completed.

Sony Service Company
A Division of Sony Electronics Inc ©2000
All Rights Reserved
Printed in U.S.A.

SONY is a trademark of Sony Electronics

SONY

SEL Service Company
A Division of Sony Electronics Inc.
1 Sony Drive
Park Ridge, New Jersey 07656

TVP111100

Printed in U.S.A.